

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 19 February 2001 (19.02.01)	
International application No. PCT/SE00/01208	Applicant's or agent's file reference P15284PC/JF
International filing date (day/month/year) 09 June 2000 (09.06.00)	Priority date (day/month/year) 10 June 1999 (10.06.99)
Applicant GRAMNÄS, Finn	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 02 January 2001 (02.01.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer R. E. Stoffel Telephone No.: (41-22) 338.83.38
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P. . . ENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 28 February 2001 (28.02.01)	
International application No. PCT/SE00/01208	Applicant's or agent's file reference P15284PC/JF
International filing date (day/month/year) 09 June 2000 (09.06.00)	Priority date (day/month/year) 10 June 1999 (10.06.99)
Applicant GRAMNÄS, Finn	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 02 January 2001 (02.01.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer C. Cupello
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Copy for the Elected Office (EO/US)

PATENT COOPERATION TREATY

PCT/SE00/01208

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

GÖTEBORGS PATENTBYRÅ DAHLS AB
Sjöporten 4
S-511 56 Kinna
SUÈDE

Date of mailing (day/month/year) 28 February 2001 (28.02.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference P15284PC/JF	International filing date (day/month/year) 09 June 2000 (09.06.00)
International application No. PCT/SE00/01208	

1. The following indications appeared on record concerning:

☐ the applicant
 ☐ the inventor
 ☒ the agent
 ☐ the common representative

Name and Address GÖTEBORGS PATENTBYRÅ DAHLS AB Sjöporten 4 S-417 64 Göteborg Sweden	State of Nationality	State of Residence
	Telephone No. 46 31 507700	
	Facsimile No. 46 31 7790640	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person
 ☐ the name
 ☒ the address
 ☐ the nationality
 ☐ the residence

Name and Address GÖTEBORGS PATENTBYRÅ DAHLS AB Sjöporten 4 S-511 56 Kinna Sweden	State of Nationality	State of Residence
	Telephone No. 46 31 50 77 00	
	Facsimile No. 46 31 779 06 40	
	Teleprinter No.	

3. Further observations, if necessary:
The new agent's address on the Demand has been considered as a change under Rule 92bis. In case of disagreement, the International Bureau should be notified immediately.

4. A copy of this notification has been sent to:

☒ the receiving Office
 ☐ the designated Offices concerned
☐ the International Searching Authority
 ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority
 ☐ other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer C. Cupello Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

COMMUNICATION IN CASES FOR WHICH
NO OTHER FORM IS APPLICABLE

From the INTERNATIONAL BUREAU

To:

Commissioner
US Department of Commerce
United States Patent and Trademark Office,
PCT
2011 South Clark Place Room CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 17 April 2001 (17.04.01)	
Applicant's or agent's file reference P15284PC/JF	REPLY DUE see paragraph 1 below
International application No. PCT/SE00/01208	International filing date (day/month/year) 09 June 2000 (09.06.00)
Applicant	GRAMTEC INNOVATION AB

1. ☐ REPLY DUE within _____ months/days from the above date of mailing
- ☐ NO REPLY DUE, however, see below
- ☒ IMPORTANT COMMUNICATION
- ☐ INFORMATION ONLY

2. COMMUNICATION:

The International Bureau requests to disregard the notification of the recording of a change (Form PCT/IB/306) which was mailed by mistake on 28 February 2001 (28.02.01).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer C. Cupello Telephone No. (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

**NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES**

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:
GÖTEBORGS PATENTBYRÅ DAHLS AB
Sjöporten 4
S-417 64 Göteborg
SUEDE

ANKOM
2000-01-02
Göteborgs Patentbyrå Dahls AB

Date of mailing (day/month/year) 21 December 2000 (21.12.00)		
Applicant's or agent's file reference P15284PC/JF		
IMPORTANT NOTICE		
International application No. PCT/SE00/01208	International filing date (day/month/year) 09 June 2000 (09.06.00)	Priority date (day/month/year) 10 June 1999 (10.06.99)
Applicant GRAMTEC INNOVATION AB et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AG,AU,DZ,KP,KR,MZ,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CR,CU,CZ,DE,DK,DM,EA,EE,EP,ES,FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,MW,MX,NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 48.1(a-bis)).
3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 21 December 2000 (21.12.00) under No. WO 00/76429

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY

CORRECTED

VERSION

INFORMATION CONCERNING ELECTED
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

From the INTERNATIONAL BUREAU

To:

GÖTEBORGS PATENTBYRÅ DAHLS AB
Sjöporten 4
S-417 64 Göteborg
SUÈDE

Göteborgs Patentbyrå

Date of mailing (day/month/year) 17 April 2001 (17.04.01)		IMPORTANT INFORMATION	
Applicant's or agent's file reference P15284PC/JF			
International application No. PCT/SE00/01208	International filing date (day/month/year) 09 June 2000 (09.06.00)	Priority date (day/month/year) 10 June 1999 (10.06.99)	
Applicant GRAMTEC INNOVATION AB et al			

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

AP : GH,GM,KE,LS,MW,MZ,SD,SL,SZ,TZ,UG,ZW

EP : AT,BE,CH,CY,DE,DK,ES,FI,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE

National : AU,BG,CA,CN,CZ,DE,IL,JP,KP,KR,MN,NO,NZ,PL,RO,RU,SE,SK,US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

EA : AM,AZ,BY,KG,KZ,MD,RU,TJ,TM

OA : BF,BJ,CF,CG,CI,CM,GA,GN,GW,ML,MR,NE,SN,TD,TG

National : AE,AG,AL,AM,AT,AZ,BA,BB,BR,BY,CH,CR,CU,DK,DM,DZ,EE,ES,FI,GB,GD,
GE,GH,GM,HR,HU,ID,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MW,MX,
MZ,PT,SD,SG,SI,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer: C. Cupello
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

SENT BY FAX

Date: 000000

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum)

P15284PC/JF

Box No. I TITLE OF INVENTION A DEVICE IN A LEG PROSTHESIS PROVIDED WITH A FOOT.	
Box No. II APPLICANT	
Name and address; (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) GRAMTEC INNOVATION AB Strömbacken 1 511 56 KINNA SWEDEN	<input type="checkbox"/> This person is also inventor. Telephone No. Facsimile No. 0320-14911 Teleprinter No.
State (i.e. country) of nationality: SE	State (that is, country) of residence: SE
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address; (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.) GRAMNÄS, Finn Hästkövägen 5 511 56 KINNA Sweden	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (that is, country) of nationality: SE	State (that is, country) of residence: SE
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address; (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) GÖTEBORGS PATENTBYRÅ DAHLS AB Sjöporten 4 S-417 64 GÖTEBORG Sweden	Telephone No. +46-31-507700 Facsimile No. +46-31-7790640 Teleprinter No.
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes: at least one must be marked):

Regional Patent

- ☒ **AP** ARIPO Patent: GH Ghana, GM Gambia KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA** Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakstan, MD Republic of Moldova RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA** OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired specify on dotted line)

- | | |
|---|---|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AG Antigua and Barbuda | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AT Austria and utility model | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> MA Morocco |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MZ Mozambique |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CR Costa Rica | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> CZ Czech Republic and utility model | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DE Germany and utility model | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DK Denmark and utility model | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> DM Dominica | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> DZ Algeria | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> EE Estonia and utility model | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> ES Spain and utility model | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> FI Finland and utility model | <input checked="" type="checkbox"/> SK Slovakia and utility model |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TZ United Republic of Tanzania |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> ZA South Africa |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | |
| <input checked="" type="checkbox"/> KR Republic of Korea and utility model | |
| <input checked="" type="checkbox"/> KZ Kazakstan | |
| <input checked="" type="checkbox"/> LC Saint Lucia | |
| <input checked="" type="checkbox"/> LK Sri Lanka | |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

☐
☐
☐

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 10.06.1999	9902193-3	SE		
item (2)				
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): SE 9902193-3

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA)
(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / SE

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)

Number

Country (or regional Office)

Box No. VIII CHECK LIST; LANGUAGE OF FILING.

This international application contains the following number of sheets:

request : 3

description (excluding
sequencelisting part) : 6

claims : 2

abstract : 1

drawings : 3

sequence listing part
of description : _____

Total number of sheets : 15

This international application is accompanied by the item(s) marked below:

- 1 ☒ fee calculation sheet
- 2 ☒ separate signed power of attorney
- 3 ☐ copy of general power of attorney; reference number, if any:
- 4 ☐ statement explaining lack of signature
- 5 ☐ priority document(s) identified in Box No. VI as item(s):
- 6 ☐ translation of international application into (language):
- 7 ☐ separate indications concerning deposited microorganism or other biological material
- 8 ☐ nucleotide and/or amino acid sequence listing in computer readable form
- 9 ☐ other (specify):

Figure of the drawings which
should accompany the abstract: 1

Language of filing of the
international application: Swedish

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

Göteborg, 2000-06-09



Lisbeth Egeröd

GÖTEBORGS PATENTBYRÅ DAHLS AB

For receiving Office use only		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

Date of receipt of the record copy
by the International Bureau:

For International Bureau use only

SENT BY FAX
Date: 000000

RECORD COPY

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No. **PCT/SE 00 / 0 1 2 0 8**

International Filing Date **0 9 -06- 2000**

Name of receiving Office and "PCT International Application"
The Swedish Patent Office

Applicant's or agent's file reference
(if desired) (12 characters maximum) **P15284PC/JF**

Box No. I TITLE OF INVENTION A DEVICE IN A LEG PROSTHESIS PROVIDED WITH A FOOT.	
Box No. II APPLICANT	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) GRAMTEC INNOVATION AB Strömbacken 1 511 56 KINNA SWEDEN	<input type="checkbox"/> This person is also inventor. Telephone No. Facsimile No. 0320-14911 Teleprinter No.
State (i.e. country) of nationality: SE	State (that is, country) of residence: SE
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.) GRAMNÄS, Finn Hästskovägen 5 511 56 KINNA Sweden	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (that is, country) of nationality: SE	State (that is, country) of residence: SE
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) GÖTEBORGS PATENTBYRÅ DAHLS AB Sjöporten 4 S-417 64 GÖTEBORG Sweden	Telephone No. +46-31-507700 Facsimile No. +46-31-7790640 Teleprinter No.
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

Box No. V DESIGNATION OF STATES

2000-06-09

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes: at least one must be marked):

Regional Patent

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Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 10.06.1999	9902193-3	SE		
item (2)				
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☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): SE 9902193-3

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Box No. VIII CHECK LIST; LANGUAGE OF FILING.


This international application contains the following number of sheets: request : 3 description (excluding sequencelisting part) : 6 claims : 2 abstract : 1 drawings : 3 sequence listing part of description : _____ Total number of sheets : 15 ✓	This international application is accompanied by the item(s) marked below: 1 <input checked="" type="checkbox"/> fee calculation sheet 2 <input checked="" type="checkbox"/> separate signed power of attorney 3 <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4 <input type="checkbox"/> statement explaining lack of signature 5 <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6 <input type="checkbox"/> translation of international application into (language): 7 <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8 <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9 <input type="checkbox"/> other (specify):
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Figure of the drawings which should accompany the abstract: 1	Language of filing of the international application: Swedish
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Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

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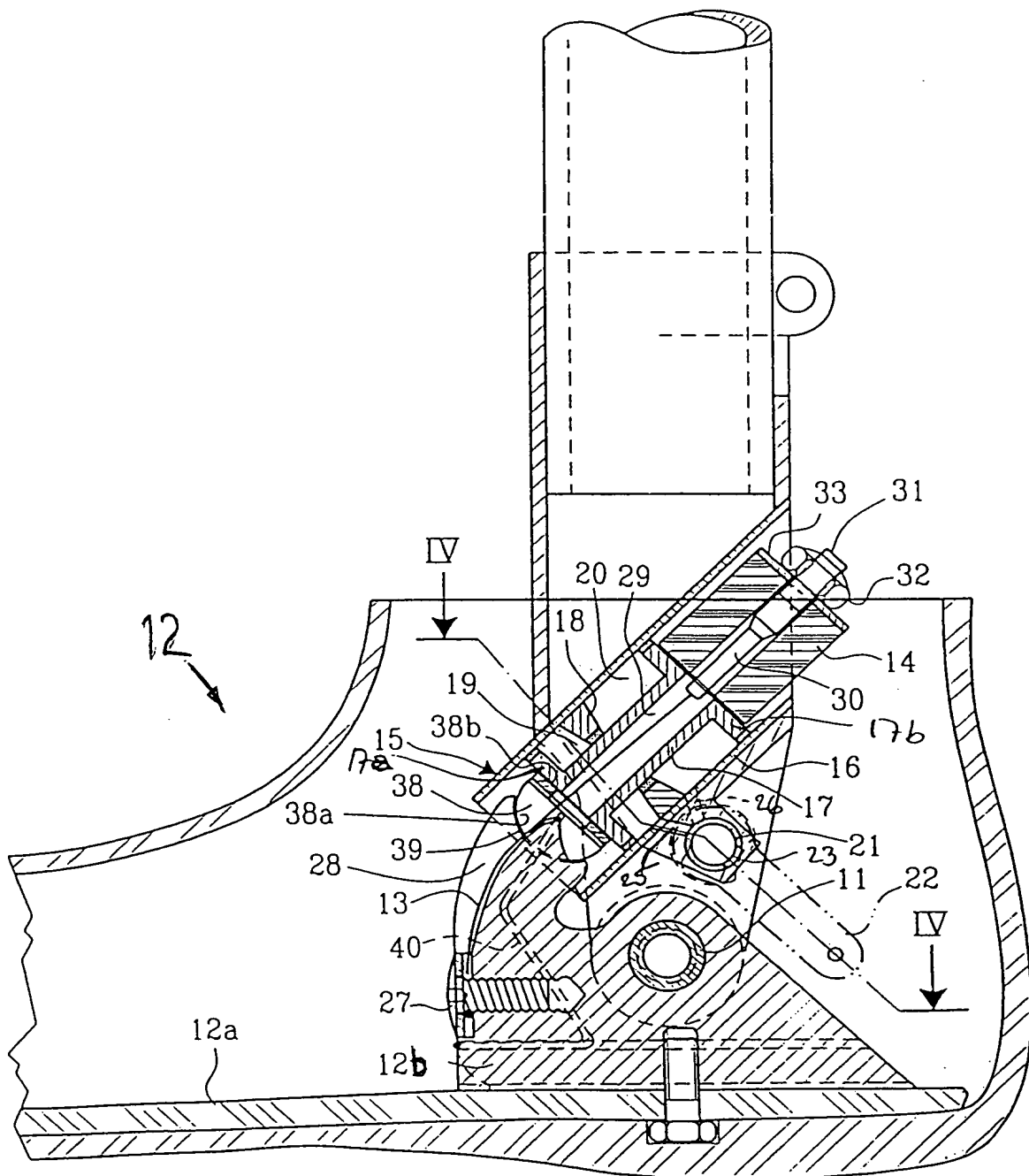


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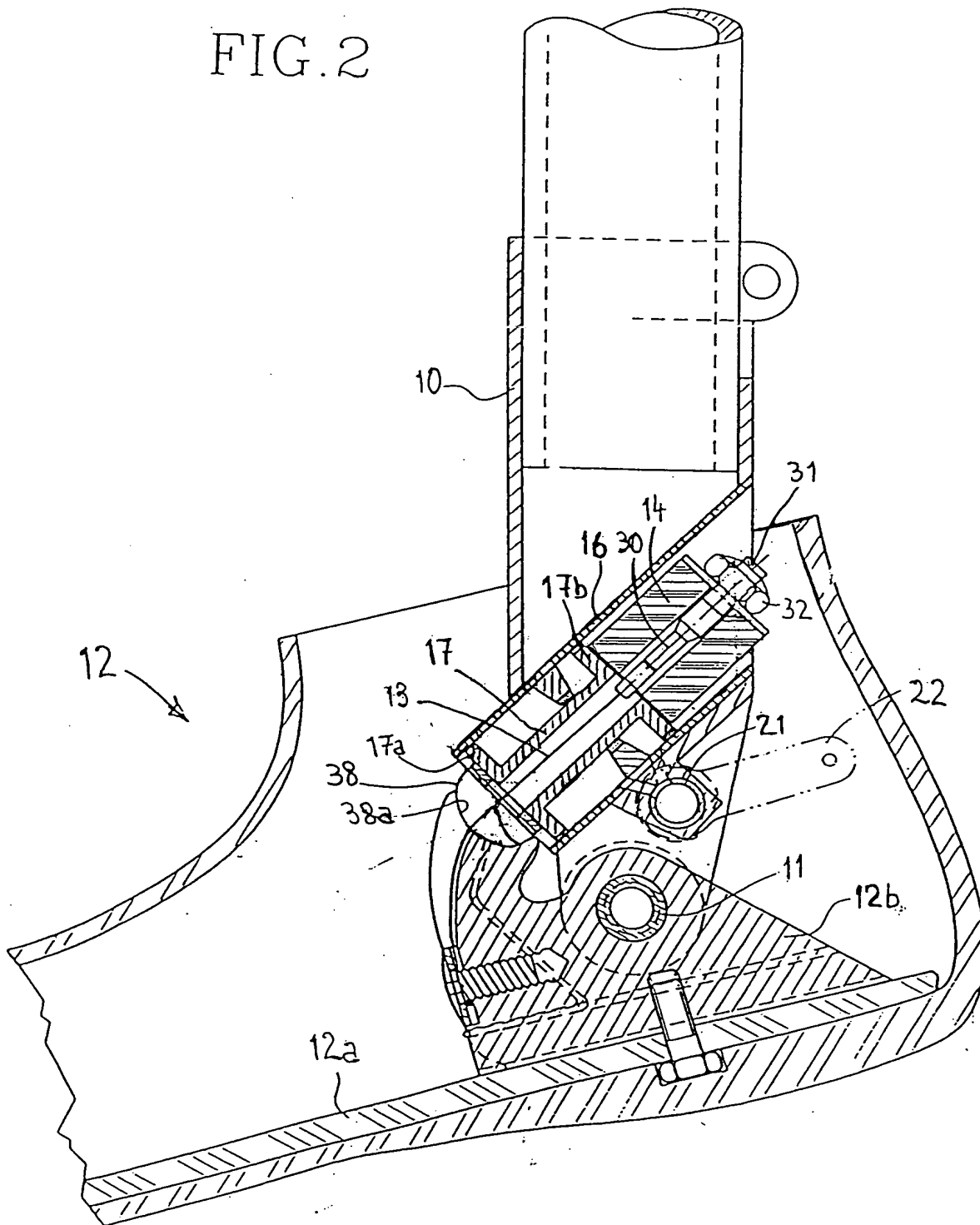
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FIG. 1



2/3

FIG. 2





Anordning vid en benprotes försedd med en fot,

TEKNISKT OMRÅDE

- 5 Föreliggande uppfinning avser en anordning vid en benprotes försedd med en fot, som via en ledaxel är förbunden med benprotesen, varvid första organ är anordnade att medge en begränsad vridning av foten relativt benprotesen från ett utgångsläge, i vilket benprotesen och foten har en bestämd vinkel relativt varandra, och andra organ är anordnade att medge en steglös reglering av vinkeln mellan benprotesen och foten i utgångsläget.

10

BAKGRUND TILL UPPFINNINGEN

- Det är välkänt bland protesbärare att gång i nedförsbacke är problematisk. Om protesbäraren ej har möjlighet att justera fotvinkeln blir gången i brant nedförsbacke sådan att det endast är hälen som har kontakt med underlaget. Över ett visst gradtal på fotvinkeln är det på grund av frånvaro av viktiga muskelgrupper svårt att hålla emot så att knäet ej kollapsar. Därför väljer ofta protesbäraren att gå sidledes nedför en backe.

- 20 Vidare har protesbärare som ej har en i höjddled justerbar fot problem med att byta till en annan sko med en annan klackhöjd, samt att snabbt kunna välja att gå utan skor. Individuell anpassning av foten i höjddled minskar även problem med ryggont och förslitna höfter.

- 25 Genom exempelvis US patentskriften 2,749,5 57 är en justerbar fot tidigare känd, vilken dock är justerbar endast i tre olika vinkellägen

- 30 Vidare visas i SE-B-456 l 34 en protesfot där fotens vinkellägen justeras med en i hälen befintlig skruv. Protesbäraren måste för att ändra vinkelläget vrida skruven ett antal varv, vilket kräver en viss arbetsinsats. Den princip för att ändra vinkeln som visas i denna skrift har den stora nackdelen att benets längd förändras, vilket medför att protesbäraren i vissa lägen kan bli hög- eller låghalt.

I SE-B-469 780 visas ytterligare ett exempel på en protesfot där fotens vinkellägen kan justeras, i detta fall med användning av en kulskruv och kulmutter.

- 5 I WO 96/25898 visas vidare en anordning av inledningsvis angivet slag.

Uppfinningen syftar till en anordning av inledningsvis angivet slag, som lätt kan anpassas till protesbärarens vikt och gångmönster, är driftsäker och enkel och billig att tillverka.

10 SAMMANFATTNING AV UPPFINNINGEN

Detta syfte uppnås medelst en anordning vid en benprotes försedd med en fot, som via en ledaxel är förbunden med benprotesen, varvid första organ är anordnade att medge en begränsad vridning av foten relativt benprotesen från ett utgångsläge, i vilket benprotesen
15 och foten har en bestämd vinkel relativt varandra, och andra organ är anordnade att medge en steglös reglering av vinkeln mellan benprotesen och foten i utgångsläget, kännetecknad av att de första organen innefattar ett fjädrande element, vilkets ena ände via ett långsträckt element är förbunden med foten och vilkets andra ände är förbunden med benprotesen så att benprotesen kan vridas relativt foten mot verkan av det fjädrande
20 elementets fjäderkraft.

I en föredragen utföringsform innefattar de andra organen ett element, som är förskjutbart relativt benprotesen, och organ för att hålla det förskjutbara elementet i önskat förskjutningsläge, varvid det förskjutbara elementet i inställt utgångsläge i sin ena ände
25 anligger mot en del hos foten och i sin andra ände mot det fjädrande elementet. Det förskjutbara organet utgöres av en kolv med utåtriktade ringflänsar, som är förskjutbar i en cylinder fäst till benprotesen, och organen för att hålla kolven i önskat förskjutningsläge relativt cylindern utgöres av en från cylinderväggen inåtskjutande ringvägg, som uppdelar utrymmet mellan kolvens ringflänsar i två kammare, samt en tvåvägsventil, som i öppet
30 läge medger strömning av i kamrarna befintligt medium mellan dessa och i stängt läge förhindrar sådan strömning. Det långsträckta elementet sträcker sig igenom en central axiell kanal i kolven och igenom en central axiell passage i det fjädrande elementet och är förbundet med den ände hos det fjädrande elementet, som är motsatt den mot kolven

anliggande änden, via en bricka av styvt material. Det långsträckta elementet består
företrädesvis av böjligt material och kan utgöras av en lina eller vajer eller ett band av ett
5 material med liten töjbarhet.

FIGURFÖRTECKNING

Uppfinningen kommer i det följande att beskrivas med hänvisning till på bifogade figurer;
10 av vilka;

figur 1 visar ett längssnitt genom en fot- och benprotes enligt en utföringsform av
upppfinningen i obelastat läge,

15 figur 2 visar ett motsvarande snitt som Figur 1 men i ett annat utgångsläge för vinkeln
mellan fot- och benprotes,

figur 3 visar fot- och benprotesen enligt figur 1 strax efter att fotprotesen satts ner, och.

20 figur 4 är ett snitt enligt linjen IV-IV i Figur 1.

BESKRIVNING AV UTFÖRINGFORMER

I figurerna visas en benprotes 10 i form av en cylindrisk rörstomme, vilken via en ledaxel
25 11 bildande fotled är förbunden med en del 12b hos en fot 12. Foten 12 kan vara försedd
med ett fotblad 12a, vilket kan förses med fotkosmetik. Ett böjligt organ 13 i form av en
lina, vajer, band eller liknande är med sin ena ände fäst till en fotdelen 12b excentriskt
relativt dennas ledaxel 11. Linan 13 löper igenom en genomgående central kanal 29 i en
kolv 17 och är med sin andra ände fäst till en nippel 30 som sträcker sig genom en central
30 passage i en elastisk kropp 14. I nippeln 30 är ingångad en skruv 31 och utanpå denna är en
mutter 32 skruvad. Mellan muttern 32 och den elastiska kroppen 14 är lämpligen anordnad
en bricka 33 av metall eller ett annat styvt material. Linan 13 har lämpligen en sådan längd
att den elastiska kroppen 14 blir inspänd mellan kolvens 17 ena ände 17b och brickan 33 i
något komprimerat tillstånd. I figur 1 visas underbens- och foten i utgångsläget,

i vilket vinkeln mellan dessa delar är ca 90^0 . I utgångsläget anligger kolven 17 med sin ände 17a mot en halvsfärisk kropp 38, som vilar i en skålformig urtagning i fotdelen 12b.

5

Kolven 17 och den elastiska kroppen 14 sträcker sig inuti en cylinder 16, som diagonalt sträcker sig igenom benprotesens nedre del ovanför ledaxeln 11. Kolvens 17 ändar 17a, 17b utgöres av utåtriktade ringflänsar, vilkas kanter tätande anligger mot cylinderns 16 vägg. Cylinder 16 har en inåtriktad ringvägg 18, vilken är anordnad mellan kolvens 17 ringflänsar och vilken tätande anligger mot rörväggen hos kolven 17. Cylinderns ringvägg 18 och respektive av kolvens ringflänsar 17a, 17b avgränsar två ringkammare 19, 20, vilka är fyllda med hydraulmedium. Dessa ringkammare kan kommunicera med varandra med hjälp av en överströmningsventil 21. Överströmningsventilen 21 är ställbar mellan öppet och stängt läge medelst en från utsidan av protesen ställbar spak 22.

15

Överströmningsventilen 21 utgöres i den visade utföringsformen av en vridbar cylindrisk ventilkropp med två öppningar 23 och 24, vilka i ventilens öppna läge (fig. 1) är vända mot och kommunicerar via hål 25 och 26 i cylinderväggen med var sin kammare 19 respektive 20. I detta läge kommunicerar således kamrarna med varandra och överströmning av hydraulmedium kan ske mellan kamrarna. I ett annat läge, som visas i fig. 2, 3 och 4, är ventilen 21 stängd varvid öppningarna 23 och 24 är vända från hålen 25 och 26.

20

Linan 13 är med sin ena ände fästad till fotdelens 11 främre parti medelst en fästskruv 27 och löper genom en krökt skåra 28 i sagda parti, vilken fungeras som riktningsändrare.

25

Linan 13 sträcker sig vidare genom den halvsfäriska kroppen 38, som har en krökt yta 38a, som samverkar med och kan vrida sig i en skålformig stödyta 39 hos fotdelen 12, samt en plan yta 38b, som samverkar med kolvens 17 ände 17a. Kroppen 38 hålls på plats i fotdelen 12a medelst en fjäder 40. I utgångsläget enligt fig. 1 är kolvens 17 ändyta 17a pressad till anliggning mot kroppens 38 plana yta 38b av förspänningen i det elastiska elementet 14, som åstadkommits vid inspänningen av detta mellan kolven 17 och brickan 33. Foten är även väsentligen obelastad i häldelen. I det i figur 1 visade läget är cylindern 16 förskjutbar relativt kolven 17. Efter att spaken 22 har förts uppåt till ventilens 21 stängda läge kan kolven 17 inte längre förskjutas relativt cylindern 16 och den fotförsedda

30

benprotesen befinner sig i sitt användningsläge.

Vid isättning av en fot under gång sätts först hälen ned och därefter föres tyngden
5 successivt över på den fot, som just satts ned. I det i fig. 3 visade läget har foten just
satts ned och tyngden har just börjat överflyttas. Vid överflyttningen av tyngden till det
nedsatta benet kommer den på hälen uppåtriktade kraften att alstra ett moment, såsom
indikeras med pilar i figur 3, som mot verkan av fjäderkraften i det elastiska elementet 14
kommer att vrida foten nedåt tills fotbladet kommer i kontakt med underlaget. Den
10 elastiska kroppen 14 fungerar härvid som en stötdämpare som fångar upp kraften som
uppkommer vid isättning av hälen. Den maximala vinkel, som benprotesen kan bilda mot
foten i det i figur 3 visade isättningsläget, begränsas av maximalt möjlig komprimering av
det elastiska elementet 14. Den vinkel, som benprotesen skall kunna bilda mot foten i det i
figur 3 visade isättningsläget för att möjliggöra en bekväm gång, är beroende av
15 protesbärarens steglängd. Den stötdämpande effekten av det elastiska elementet beror på
protesbärarens vikt och gångmönster. Det som en stötdämpare fungerande elastiska
organet 14 kan individuellt anpassas genom förspänningen som åstadkommes medelst
varierande åtdragning av muttern 32 och genom val av maximal komprimeringslängd för
elementet. Genom att det elastiska elementet är lätt att ta bort och sätta dit kan det lätt
20 bytas ut mot ett annat element, som är bättre avpassat mot protesbärarens kroppsvikt och
gångmönster. Utslitna elastiska element kan lätt bytas mot nya.

En obelastad fot kommer automatiskt att inta inställt utgångsläge på grund av att det
fjädrande elementet 14 alltid strävar att inta sitt expanderande läge.

25

Om man vill ändra utgångsläge, dvs. ändra vinkeln mellan benprotesen 10 och foten 12,
t.ex. vid byte till skor med hög klack, öppnas överströmningsventilen 21 medelst spaken
22, varvid en överströmning av hydraulmedium kan ske mellan kamrarna 19 och 20. Detta
medför att cylindern 16 steglöst kan förskjutas relativt kolven 17 och det elastiska
30 elementet 14, vilket medger att benprotesen 10 kan vridas relativt foten inom ramen för
möjlig förskjutning av cylinderns 16 ringvägg 18 i kamrarna 19,20. Samtidigt med

förskjutningen av cylindern relativt kolven kommer cylindern att vridas kring ledaxeln 11, vilket åtföljes av en vridning av kroppen 38, kolven 17 och det elastiska elementet 14.

Linans 13 läge i kanalen 29 kommer därvid även att förändras, såsom visas i fig. 2.

- 5 Diametern av kanalen 29 är avpassad för att medge den relativa lägesförändringen av linan 13. När önskad vinkel mellan benprotes och fot är uppnådd stängs ventilen 21.

- 10 I praktiken sker inställning av nytt utgångsläge genom att skon med hög klack sätts på foten, varefter ventilen öppnas. Benprotesen föres sedan till ett vertikalt läge och ventilen stängs.

- 15 Det elastiska elementet 14 utgörs i den i figurerna visade utföringsformen av en elastisk kropp 14 av t ex gummi eller annat elastiskt polymert material. Det är naturligtvis möjligt att använda inom ramen för uppfinningen använda andra typer av fjädrande kroppar, t.ex. skruv- eller tallriksfjädrar. Det böjliga organet 13 består av ett material som inte töjer sig vid de belastningar som normalt förekommer vid användning av benproteser och kan vara tillverkat av stål, plast eller textilmaterial.

- 20 Modifikationer av uppfinningen är naturligtvis tänkbara inom ramen för uppfinningen. Exempelvis skulle ventilen 21 kunna vara manövrerbar av en elmotor, t.ex. en stegmotor, och benprotesen innehålla ett batteri och en strömbrytare, vilken kan placeras lätt tillgänglig för protesanvändaren. Vidare skulle kolven 17 kunna ersättas av en styv hylsa, som löper i en slitsförsedd cylinder försedd med en anordning för att klämma fast cylindern mot hylsan. Det är inte heller nödvändigt att organet 13 är böjligt utan linan 13
25 kan ersättas med en stav eller liknande som är ledad till kroppen 38 och nippeln 30. Uppfinningen skall därför endast begränsas av innehållet i bifogade patentkrav.

PATENTKRAV

1. Anordning vid en benprotes (10) försedd med en fot (12), som via en ledaxel (11) är
5 förbunden med benprotesen, varvid första organ (13,14,16-18,30-33,38) är anordnade att
medge en begränsad vridning av foten relativt benprotesen från ett utgångsläge, i vilket
benprotesen och foten har en bestämd vinkel relativt varandra, och andra organ (16-26) är
anordnade att medge en steglös reglering av vinkeln mellan benprotesen och foten i
utgångsläget, **kännetecknad** av att de första organen (13,14,16-18,30-33,38) innefattar
10 ett fjädrande element (14), vilket ena ände via ett långsträckt element (13) är förbunden
med foten (12) och vilket andra ände är förbunden med benprotesen så att benprotesen
kan vridas relativt foten mot verkan av det fjädrande elementets fjäderkraft.

2. Anordning enligt krav 1, **kännetecknad** av att de andra organen (16-26) innefattar ett
15 element (17), som är förskjutbart relativt benprotesen (10), och organ (18, 21) för att hålla
det förskjutbara elementet i önskat förskjutningsläge, varvid det förskjutbara elementet i
inställt utgångsläge i sin ena ände anliggar mot en del (38) hos foten (12) och i sin andra
ände mot det fjädrande elementet (14).

3. Anordning enligt krav 2, **kännetecknad** av att det förskjutbara organet utgöres av en
20 kolv (17) med utåtriktade ringflänsar, som är förskjutbar i en cylinder (16) fäst till
benprotesen (10), och organen för att hålla kolven i önskat förskjutningsläge relativt
cylindern utgöres av en från cylinderväggen inåtskjutande ringvägg (18), som uppdelar
utrymmet mellan kolvens ringflänsar i två kammare, samt en tvåvägsventil (21), som i
25 öppet läge medger strömning av i kamrarna befintligt medium mellan dessa och i stängt
läge förhindrar sådan strömning.

4. Anordning enligt krav 3, **kännetecknad** av att det långsträckta elementet (13) sträcker
sig igenom en central axiell kanal (29) i kolven (17) och igenom en central axiell passage i
30 det fjädrande elementet och är förbundet med den ände hos det fjädrande elementet (14),
som är motsatt den mot kolven anliggande änden, via en bricka (33) av styvt material.

5. Anordning enligt något av föregående krav, **kännetecknad av** att det långsträckta elementet består av böjligt material.
- 5 6. Anordning enligt krav 5, **kännetecknad av** att det långsträckta elementet (13) utgöres av en lina eller vajer eller ett band av ett material med liten töjbarhet.

Sammandrag

Föreliggande uppfinning avser en anordning vid en benprotes (10) försedd med en fot (12),
5 som via en ledaxel (11) är förbunden med benprotesen, varvid första organ (13,14,16-
18,30-33,38) är anordnade att medge en begränsad vridning av foten relativt benprotesen
från ett utgångsläge, i vilket benprotesen och foten har en bestämd vinkel relativt varandra,
och andra organ (16-26) är anordnade att medge en steglös reglering av vinkeln mellan
benprotesen och foten i utgångsläget. Enligt uppfinningen innefattar de första organen
10 (13,14,16-18,30-33,38) ett fjädrande element (14), vilkets ena ände via ett långsträckt
element (13) är förbunden med foten (12) och vilkets andra ände är förbunden med
benprotesen så att benprotesen kan svängas relativt foten mot verkan av det fjädrande
elementets fjäderkraft.

15

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Figur 1 önskas publicerad

25

PATENT COOPERATION TREATY

PCT

REC'D 28 JUN 2001

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference P15284PC/MH	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/SE00/01208	International filing date (day/month/year) 09.06.2000	Priority date (day/month/year) 10.06.1999
International Patent Classification (IPC) or national classification and IPC ₇ A61F 2/66		
Applicant GRAMTEC INNOVATION et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 02.01.2001	Date of completion of this report 15.06.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Hélène Erikson/MP Telephone No. 08-782 25 00

Form PCT/IPEA/409 (cover sheet) (January 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE00/01208

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed

☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement) under article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE00/01208

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-6</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>1-6</u>	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	<u>1-6</u>	YES
	Claims	_____	NO

2. Citations and explanations (Rule 70.7)

The claimed invention relates to an arrangement for a leg prosthesis provided with a foot. The foot is connected to the leg prosthesis via an articulated axis. A first means are arranged to provide a limited rotation of the foot relative to the leg from an initial position. A second means are arranged to provide a variable adjustment of the fixed angle between the leg prosthesis and the foot in the initial position.

The most relevant documents cited in the search report are the following:

D1 US 2 470 480
D2 WO 96 25 898 A1
D3 DE 818 828 C1

D1 relates to an artificial foot and ankle construction. A base plate is mounted on the heel portion of the foot plate or sole, and mounts a pair of front and rear vertical cylinders spaced apart longitudinally and located centrally of the width of the heel and base plate with their upper ends positioned beneath the ends of the ankle plate. Pistons or plungers operate vertically in the cylinders and have connecting rods pivotally connected by suitable bearing brackets.

D2 presents an adjustable prosthesis joint such as prosthesis ankle or prosthesis foot. It has members constituted by two communicating chambers containing flow medium, with shiftable valve provided between chambers and body designed as piston rotatably arranged in relation to the chambers.

.../...

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE00/01208

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

D3 also discloses an artificial foot and ankle construction comprising hydraulic chambers with a valve between.

However, none of the documents above mention an artificial foot and ankle construction with both means to provide a limited rotation of the foot and means to provide a variable adjustment of the fixed angle between the leg prosthesis and the foot.

In view of the above, the cited documents only disclose the general state of the art, which is not considered to be of particular relevance. Therefore, the claimed invention is considered to fulfil the requirements of novelty, inventive step and industrial applicability according to PCT Article 33.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
21 December 2000 (21.12.2000)

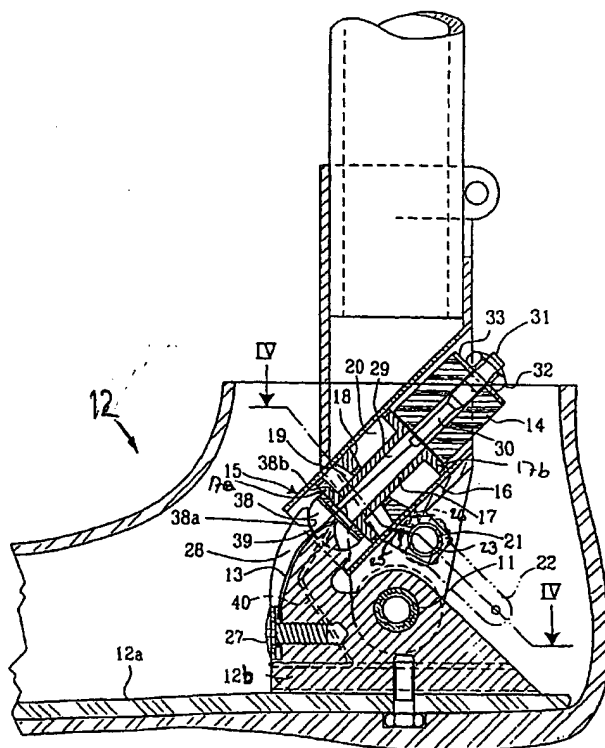
PCT

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Sjöporten 4, S-417 64 Göteborg (SE).
- (21) International Application Number: PCT/SE00/01208
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CN, CR, CU, CZ, CZ (utility model), DE, DE (utility
model), DK, DK (utility model), DM, DZ, EE, EE (utility
model), ES, FI, FI (utility model), GB, GD, GE, GH, GM,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KR (utility
model), KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,
MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD,
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- (71) Applicant (*for all designated States except US*):
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- (72) Inventor; and
- (75) Inventor/Applicant (*for US only*): GRAMNÄS, Finn
[SE/SE]; Hästskovägen 5, S-511 56 Kinna (SE).
- (84) Designated States (*regional*): ARIPO patent (GH, GM,
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patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,

[Continued on next page]

(54) Title: A DEVICE IN A LEG PROSTHESIS PROVIDED WITH A FOOT



(57) Abstract: The present invention relates to an arrangement for a leg prosthesis (10) provided with a foot (12), which is connected to the leg prosthesis via an articulated axle (11), whereby first means (13, 14, 16-18, 30-33, 38) are arranged to provide a limited rotation of the foot relative the leg prosthesis from an initial position, in which position the leg prosthesis and the foot have a fixed angle relative each other, and second means (16-26) are arranged to provide a step-less adjustment of the fixed angle between the leg prosthesis and the foot in the initial position. According to the invention the first means (13, 14, 16-18, 30-33, 38) comprise a resilient element (14), which first end thereof is connected to the foot (12) via an elongated element (13) and which second end is connected to the leg prosthesis so that the leg prosthesis can be rotated relative the foot against the effect of the spring force of the resilient element.

WO 00/76429 A1

WO 00/76429 A1



IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *With international search report.*

3/PATS

A DEVICE IN A LEG PROSTHESIS PROVIDED WITH A FOOT**TECHNICAL FIELD**

5 The present invention relates to a device in a leg prosthesis provided with a foot, which is connected to the leg prosthesis via an articulated axle, whereby first means are arranged to provide a limited rotation of the foot relative the leg prosthesis from an initial position, in which position the leg prosthesis and the foot have a fixed angle relative each other, and second means are arranged to provide a step-less adjustment of the fixed angle between the leg prosthesis and the foot in the initial position.

BACKGROUND OF THE INVENTION

10 It is well known among prosthesis wearers that downhill walking is problematic. If the prosthesis wearer does not have the possibility of adjusting the angle of the foot, the walk downhill gets such that only the heel has contact with the ground. Above a certain degree of foot angle it is difficult to bear up the body weight so that the knee does not collapse because of the lack of essential groups of muscles. Therefore, prosthesis wearers often choose to walk sideways when walking downhills.

20 Further, prosthesis wearers who, have not got a foot which is vertically adjustable, have problems changing to another shoe with a different heel height, and to rapidly choose to walk without shoes. Individual, vertical adjustment of the foot even reduces problems with pain in the back and worn out hips.

25 Through for instance US patent document 2,749,557 is known an adjustable foot, however it is only adjustable to three different angular positions.

30 Furthermore, SE-B-456 134 shows a prosthesis foot where the angular positions of the foot are adjusted with a screw existing in the heel of the foot. The prosthesis wearer must turn the screw a number of turns to change the angle position, which requires a certain work effort. The principle of changing the angle shown in this document has the great

disadvantage that the length of the leg changes, which results in that the prosthesis wearer can have one leg shorter or longer than the other in certain situations.

Further, SE-B-469 780 shows an additional example of a prosthesis foot where the angle position of the foot can be adjusted, in this case using a ball screw and ball nut.

5

Furthermore, WO 96/25989 shows a device of the kind mentioned in the preamble.

The invention relates to a device of the kind mentioned in the preamble, which can easily be adjusted to the weight and walk pattern of the prosthesis wearer and which is reliable and simple and cheap to manufacture.

10

SUMMARY OF THE INVENTION

This aim is achieved by means of a device in a leg prosthesis provided with a foot, which is connected to the leg prosthesis via an articulated axle, whereby first means are arranged to allow a limited rotation of the foot relative the leg prosthesis from an initial position, in which position the leg prosthesis and the foot have a fixed angle relative each other, and second means are arranged to provide a step-less adjustment of the fixed angle between the leg prosthesis and the foot in the initial position, characterized in that the first means comprise a resilient element, which first end thereof is connected to the foot via a elongated element and which second end is connected to the leg prosthesis so that the leg prosthesis can be rotated relative the foot against the effect of the spring force of the resilient element.

15

20

In a preferred embodiment the second means comprise a displaceable element, which is displaceably arranged relative the leg prosthesis, and means to hold the displaceably arranged element in a desired displacement position, whereby the displaceable element, set in its initial position, in one end bears on a portion of the foot and in its other end on the resilient element. The displaceable means is formed by a piston with outwardly directed ring flanges, which piston is displaceably arranged in a cylinder attached to the leg prosthesis, and the

25

means for holding the piston in a desired displacement position relative the cylinder is formed by a ring wall projecting inwards from the cylinder, which wall divides the space between the ring flanges of the piston in two chambers, and a two-way valve, which in opened position provides flow of the medium existing in the chambers between these and in closed position prevents such flow. The elongated element extends through a central axial channel in the piston and through a central axial passage in the resilient element and is connected, via a washer of rigid material, to that end of the resilient element, which is opposite the end which bears on the piston. The elongated element constitutes of flexible material and can be made of a cord or wire or of a belt of a material with little extensibility.

LIST OF DRAWINGS

In the following the invention will be described with reference to enclosed figures, in which;

Figure 1 shows a longitudinal cross section through a foot and leg prosthesis according to an embodiment of the invention in unloaded position,

Figure 2 shows a section corresponding to Figure 1, but in another initial position for the angle between foot and leg prosthesis,

Figure 3 shows the foot and leg prosthesis according to Figure 1 just after the foot prosthesis has been set down, and

Figure 4 is a section along line IV-IV in Figure 1.

DESCRIPTION OF EMBODIMENTS

The Figures show a leg prosthesis 10 in the form of cylindrical tube frame, which via an articulated axle 11, forming an ankle joint, is connected to a portion 12b of a foot 12. The foot 12 can be provided with a foot blade 12a, which can be provided with foot cosmetics.

The flexible element 13 in the form of a cord, wire or belt or similar is eccentrically attached to the portion 12b of the foot relative its articulated axle 11. The cord 13 runs through a central channel 29 running through a piston 17 and is attached to a nipple 30 with its second end, which nipple 30 extends through a central passage in an elastic body 14. A

screw 31 is threaded into the nipple 30 and a nut 32 is screwed on the outside of the screw. Preferably, a washer 33 of metal or other rigid material is provided between the nut 32 and the elastic body 14. Suitably, the cord 13 has such a length that the elastic body 14 is restrained between one end 17b of the piston 17 and the washer 33 in a somewhat compressed state. Figure 1 shows the shank and the foot in the initial position, in which the angle between these parts is about 90°. In the initial position the end 17a of the piston 17 bears onto a half spherical body 38, which rests in a cup-shaped recess in the foot portion 12b.

The piston 17 and the elastic body 14 extend inside a cylinder 16, which diagonally extends through the lower part of the leg prosthesis above the articulated axle 11. The ends 17a, 17b of the piston 17 are formed by outwardly directed ring flanges, which edges sealingly bear against the wall of the cylinder 16. The cylinder 16 has an inwardly directed ring wall 18, which is arranged between the ring flanges of the piston 17 and which sealingly bears against the tube wall of the piston 17. The ring wall 18 of the cylinder and the respective ring flanges 17a, 17b of the piston delimit two ring chambers 19, 20, which are filled with hydraulic medium. These ring chambers can communicate with each other by means of an overflow valve 21. The overflow valve 21 is adjustable between opened and closed position by means of an adjustable lever 22 on the outside of the leg prosthesis.

In the shown embodiment, the overflow valve 21 is formed by a rotatable cylindric valve body with two openings 23 and 24, which in the opened position of the valve (Fig. 1) are facing and communicating via holes 25 and 26 in the wall of the cylinder with one chamber 19 and 20 respectively each. Thus, the chambers communicate with each other in this position and overflow of hydraulic medium can exist between the chambers. In another position, which is shown in Fig. 2, 3 and 4, the valve 21 is closed whereby the openings 23 and 24 are facing away from the holes 25 and 26.

One end of the cord 13 is attached to the front portion of the foot portion 11 by means of an attachment screw 27 and runs through a curved slot 28 in said portion, which works as direction changer. The cord 13 further runs through the half spherical body 38, which has a curved surface 38a, which cooperates with and can rotate in a cup-shaped support surface 39 at the foot portion 12, and a plane surface 38b, which cooperates with the end 17a of the piston 17. The body 38 is kept in place in the foot portion 12a by means of a spring 40. In the initial position according to Fig. 1, the end surface 17a of the piston 17 is pressed into contact with the plane surface 38b of the body 38 because of the preload of the resilient element 14, which is effected by the restraint thereof between the piston 17 and the washer 33. The foot is also substantially unloaded in the heel portion. In the position shown in Figure 1, the cylinder 16 is displaceable relative the piston 17. After the lever 22 has been brought up to the closed position of the valve 21, the piston 17 can no longer be displaced relative the cylinder 16 and the leg prosthesis provided with a foot is in its usage position.

When setting down a foot during walk, the heel is first set down and thereafter the weight is successively brought over to that foot, which was just set down. In the position shown in Fig. 3 the foot has just been set down and the transfer of weight has just begun. During the transfer of weight to the set down leg, the upward force on the heel will generate a moment, such as is indicated with arrows in Fig. 3, that by effect of the spring force in the resilient element 14 will rotate the foot downwards until the foot blade comes into contact with the ground. In this case, the elastic body 14 works as a shock absorber that absorbs the force that arise when the heel is set down. The maximum angle that the leg prosthesis can form against the foot in the set down position in Fig. 3, is limited by the maximum possible compression of the elastic element 14. The angle that the leg prosthesis should be able to form against the foot in the set down position of Fig. 3 to provide a comfortable walk, is dependent of the length of the steps of the prosthesis wearer. The shock absorbing effect of the resilient element depends on the weight and walk pattern of the prosthesis wearer. The resilient element 14 working as shock absorber can be individually adjusted by preload that is achieved by means of varying the tightening of the nut 32 and by choosing maximum

length of compression of the element. As the resilient element is easy to remove and put back, it can easily be changed to another element, which is more suitable for the body weight and walk pattern of the prosthesis wearer. Resilient elements that are worn out can easily be changed to new ones.

5 An unloaded foot will automatically be displaced to the initial position because of the fact that the resilient element 14 always aims to come into its expanded position.

10 If it is desired to change the initial position, i. e change the angle between the leg prosthesis 10 and the foot 12, e. g when changing to shoes with high heels, the overflow valve 21 is opened by means of the lever 22, whereby an overflow of hydraulic medium can exist between the chambers 19 and 20. This entails the cylinder 16 to be continuously displaced relative the piston 17 and the resilient element 14, which permits the leg prosthesis to be rotated relative the foot within the limits of possible displacement of the ring wall 18 of the cylinder 16 in the chambers 19, 20.

15 At the same time as the displacement of the cylinder relative the piston, the cylinder will be rotated around the articulated axle 11, which is followed by a rotation of the body 38, the piston 17 and the resilient element 14. The position of the cord 13 in the channel 29 will also change, as is shown in the Fig. 2. The diameter of the channel 29 is adjusted to permit
20 the relative change in position of the cord 13. When a desired angle between the leg prosthesis and the foot has been reached, the valve 21 is closed.

25 In practice, adjustment to a new initial position is made through that the shoe with high heel is put on the foot, whereby the valve is opened. The leg prosthesis is then placed in a vertical position and the valve is closed.

In the embodiments shown in the Figures, the resilient element 14 constitutes of an elastic body 14 of e. g rubber or other elastic polymeric material. Within the scope of the invention

it is of course possible to use other types of resilient bodies, e. g helical or cup springs. The resilient element 13 is formed by a material which does not stretches due to the loads which normally exist during usage of leg prostheses and can be made of steel, plastic or textile material.

5 Naturally, modifications of the invention are possible within the scope of the invention. For example, the valve 21 could be manoeuvrable by an electric motor, e. g a step motor, and the leg prosthesis could comprise a battery and a switch, which can be placed so that it is easy to reach for the prosthesis wearer. Furthermore, the piston 17 could be replaced by a rigid sleeve, which runs in a cylinder provided with a slit, which cylinder is provided with a
10 device for clamping the cylinder against the sleeve. Nor is it necessary that the element 13 is resilient, the cord 13 can instead be replaced with a rod or the like which is articulated to the body 38 and the nipple 30. Therefore, the invention should only be limited to the contents of the appending claims.

CLAIMS

1. Arrangement for a leg prosthesis (10) provided with a foot (12), which is connected to the leg prosthesis via an articulated axle (11), whereby first means (13, 14, 16-18, 30-33, 38) are arranged to provide a limited rotation of the foot relative the leg prosthesis from an initial position, in which position the leg prosthesis and the foot have a fixed angle relative each other, and second means (16-26) are arranged to provide a step-less adjustment of the angle between the leg prosthesis and the foot in the initial position,
characterized in,
that the first means (13, 14, 16-18, 30-33, 38) comprise a resilient element (14), which first end thereof is connected to the foot (12) via an elongated element (13) and which second end is connected to the leg prosthesis so that the leg prosthesis can be rotated relative the foot against the effect of the spring force of the resilient element.
2. Arrangement according to claim 1,
characterized in,
that the second means (16-26) comprise an element (17), which is displaceable relative the leg prosthesis (10), and means (18, 21) to hold the displaceable element in a desired displacement position, whereby the displaceable element, set in its initial position, in one end bears on a portion (38) of the foot (12) and in its second end on the resilient element (14).
3. Arrangement according to claim 2,
characterized in,
that the displaceable means comprise a piston (17) with outwardly directed ring flanges, which piston is displaceably arranged in a cylinder (16) attached to the leg prosthesis (10), and the means for holding the piston in desired displacement position relative the cylinder comprise a ring wall (18) projecting inwards from the cylinder, which wall divides the

space between the ring flanges of the piston in two chambers, and a two-way valve (21), which in opened position provides flow of the medium existing in the chambers between these and in closed position prevents such flow.

4. Arrangement according to claim 3,

5

characterized in,

that the elongated element (13) extends through a central axial channel (29) in the piston (17) and through a central axial passage in the resilient element and is connected, via a washer (33) of rigid material, to that end of the resilient element (14), which is opposite the end which bears on the piston.

10

5. Arrangement according to any of the preceding claims,

characterized in,

that the elongated element is constituted by flexible material.

15

6. Arrangement according to claim 5,

characterized in,

that the elongated element (13) is constituted by a cord or wire or of a belt of a material with little extensibility.

20

FIG. 1

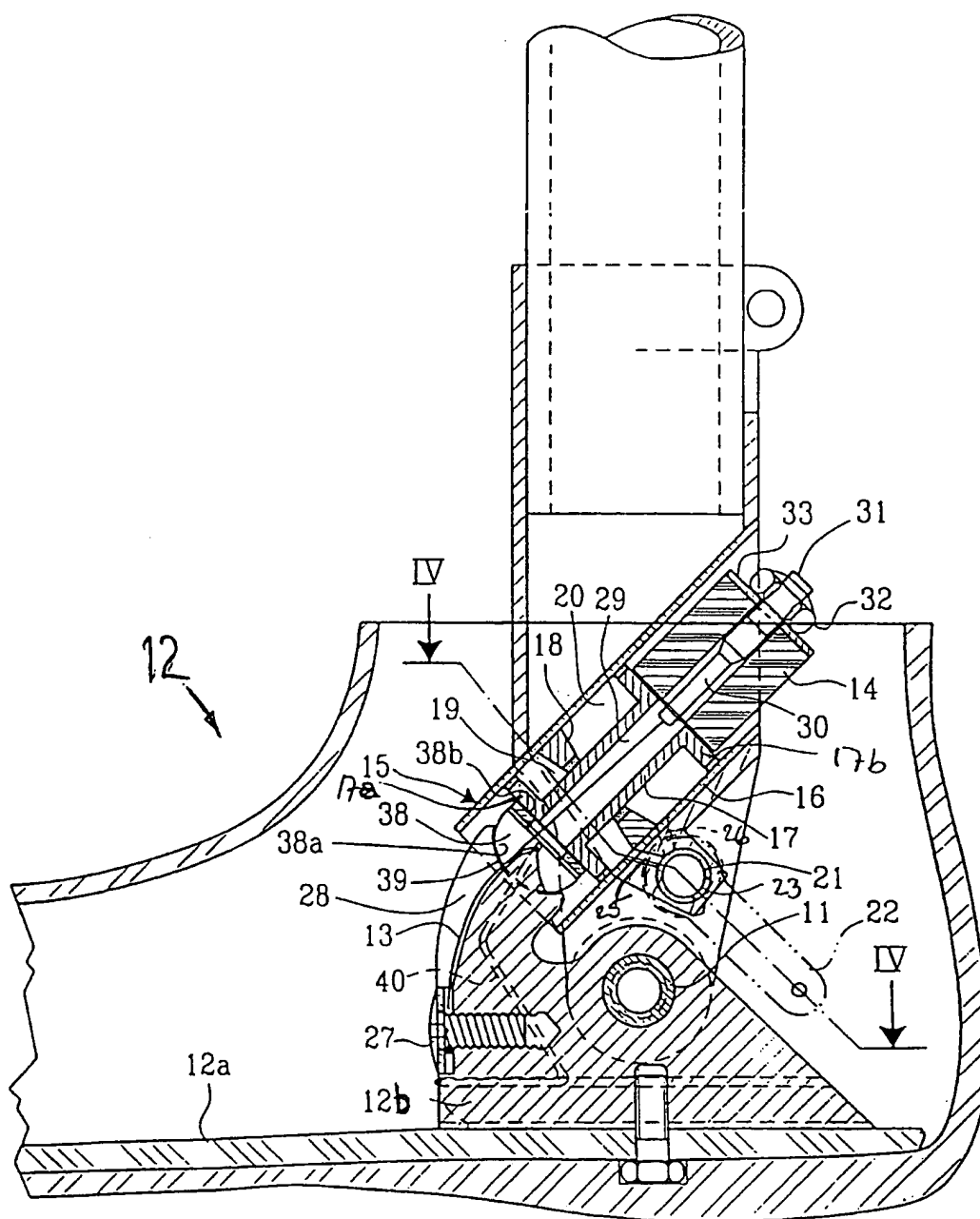
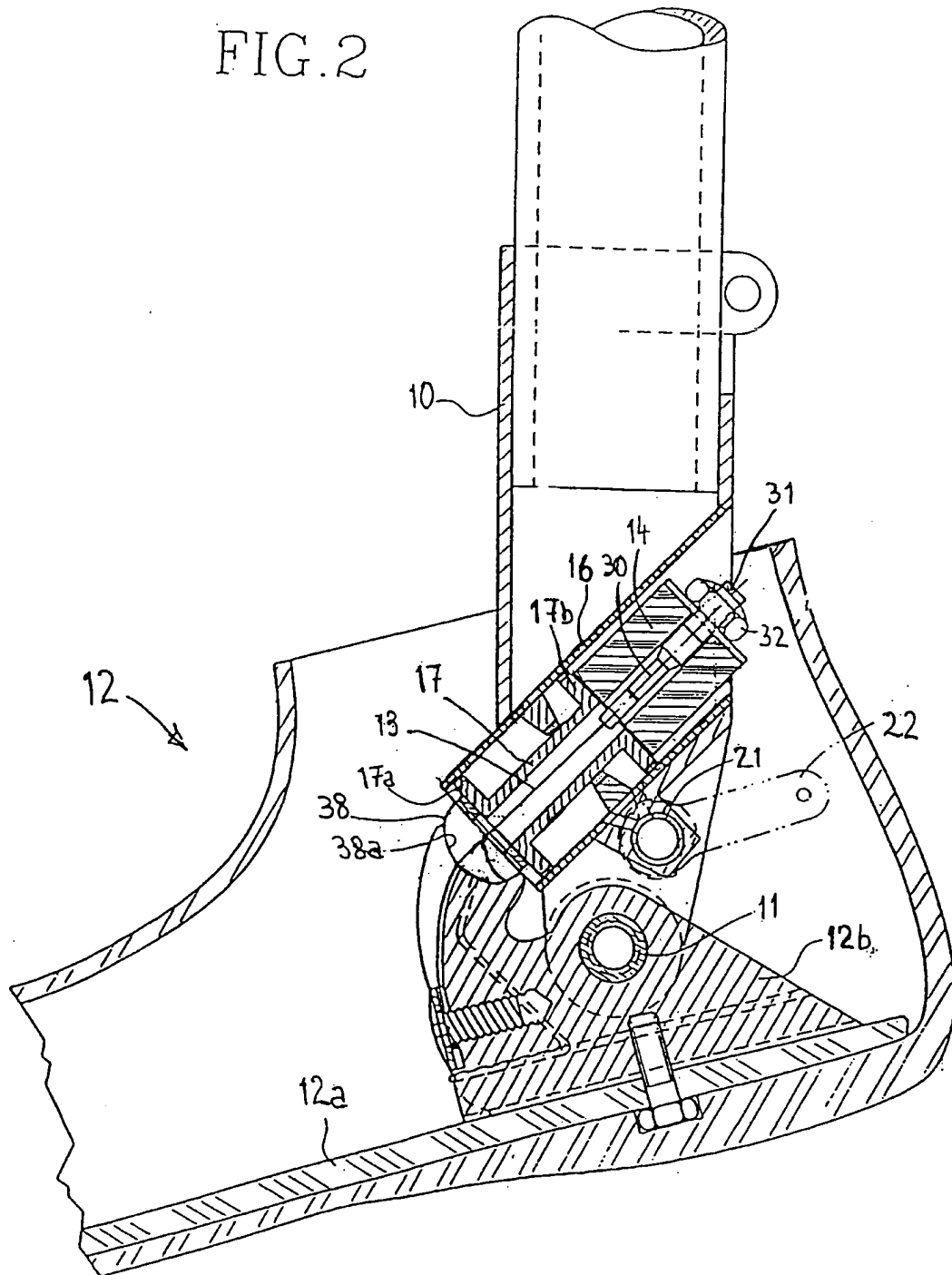


FIG. 2



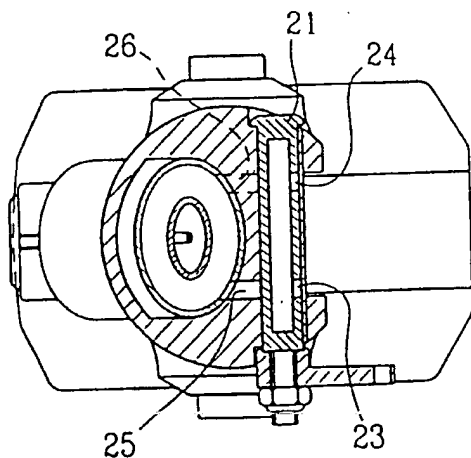


FIG.4

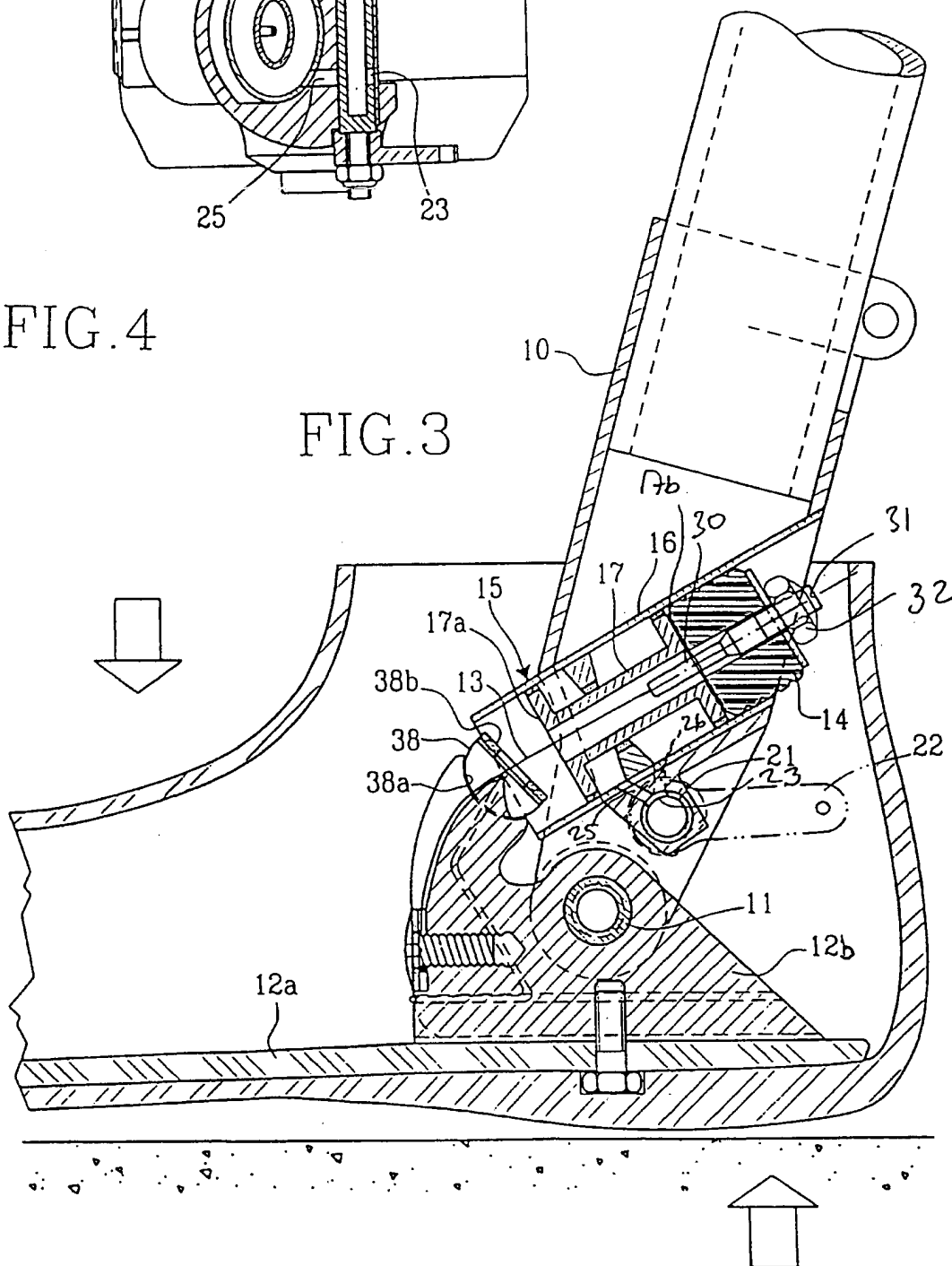


FIG.3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01208

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61F 2/66

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2470480 A (S.R. FOGG), 17 May 1949 (17.05.49), column 3, line 64 - column 4, line 34, figures --	1-6
Y	WO 9625898 A1 (GRAMTEC INNOVATION AB), 29 August 1996 (29.08.96), claim 1, figure --	1-6
Y	DE 818828 C1 (ALBERT SCHWARZ), 29 October 1951 (29.10.51), figure, claims --	1-6
A	FR 800547 A (C. & E. STREISGUTH), 4 May 1936 (04.05.36) --	1-6

☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

4 Sept 2000

Date of mailing of the international search report

14 -09- 2000

 Name and mailing address of the ISA/
 Swedish Patent Office
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 Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01208

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4499613 A1 (HARRY A. YARROW), 19 February 1985 (19.02.85), abstract, figure --	1-6
A	SE 456134 B (YNGVE LJUNGBLAD), 12 Sept 1988 (12.09.88), abstract, claims, figure --	1-6
A	DE 838480 C (WILHELM GUNDERMANN), 8 May 1952 (08.05.52) -- -----	1-6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SE 00/01208

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	2470480	A	17/05/49	NONE	
WO	9625898	A1	29/08/96	AU 2687795 A	04/01/96
				AU 4852796 A	11/09/96
				CA 2213097 A	29/08/96
				EP 0779839 A	25/06/97
				EP 0810846 A	10/12/97
				JP 11503929 T	06/04/99
				SE 511750 C	15/11/99
				SE 9500653 A	22/08/96
				US 5716431 A	10/02/98
				US 5957981 A	28/09/99
DE	818828	C1	29/10/51	NONE	
FR	800547	A	04/05/36	NONE	
US	4499613	A1	19/02/85	NONE	
SE	456134	B	12/09/88	AU 1391688 A	26/09/88
				DK 585088 A	20/10/88
				EP 0417073 A	20/03/91
				FI 893810 D	00/00/00
				JP 2502341 T	02/08/90
				NO 884723 A	24/10/88
				SE 8700791 D	00/00/00
				WO 8806431 A	07/09/88
DE	838480	C	08/05/52	NONE	